

Unit 4 – Cellular Reproduction

Chapters 5 & 8

Biology

Student Learning Targets

Always know the vocabulary!

___ 4.1 Explain the importance of the cell cycle and each of the cell cycle stages. (pg. 126-128)

- 4.1.A List the stages of the cell cycle in order, and describe what happens in each stage. (pg. 126-127)
- 4.1.B Compare rates of cell division in different types of cells. (*Note: You do not need to memorize rates for specific cells, but you should have a basic understanding of why different types of cells would require different rates*). (pg. 128)
- 4.1.C Give several reasons why a cell may need to undergo cell division. (class notes)

___ 4.2 Explain why there is a limit to cellular size. (pg. 128-129)

___ 4.3 Explain the difference between DNA and chromatin, and describe the structure and function of each during cell division. (pg. 130-133)

- 4.3.A Identify the number of chromosomes found in humans. (pg. 130 & class notes)
- 4.3.B Describe how the structure of chromatin changes at different stages of the cell cycle. (pg. 130-133)
- 4.3.C Explain the importance of histones in chromatin organization. (pg. 131)
- 4.3.D Identify the region of the chromosome where spindle fibers attach during cell division. (pg. 131)

___ 4.4 Explain the process of Mitosis. (pg. 132-134, 160)

- 4.4.A Explain the importance of the spindle during mitosis. (pg. 132-133)
- 4.4.B Describe the movement of chromosomes/chromatids during mitosis. (pg. 132-133)
- 4.4.C Identify the cells at the beginning and ending of mitosis as haploid or diploid. (pg. 160 & class notes)
- 4.4.D Explain the role of cytokinesis in cellular division. (pg. 132-134)

___ 4.5 Explain how the cell cycle is regulated and what happens when there is a failure in regulation. (pg. 136-139)

- 4.5.A Explain the role of growth factors in regulating the cell cycle. (pg. 136-137)
- 4.5.B Define apoptosis, and explain its importance in organisms. (pg. 137)
- 4.5.C Explain how cell division is related to tumor formation and cancer. (pg. 138-139)
- 4.5.D Compare and contrast benign and malignant tumors. (pg. 138)
- 4.5.E Explain three different possible treatments for cancer. (pg. 139 & class notes)

___ **4.6 Explain the process of asexual reproduction. (pg. 140-141, 160)**

- 4.6.A** Describe how the offspring of sexual and asexual reproduction compare to the parents of the offspring. (pg. 140, 160)
- 4.6.B** Define binary fission, and compare and contrast the process with mitosis. (pg. 140)

___ **4.7 Explain the structure of DNA. (pg. 216-218)**

- 4.7.A** Describe the structure of a nucleotide. (pg. 216)
- 4.7.B** List the four nucleotides that make up DNA and the base pairing rules for these nucleotides. (pg. 217-218)
- 4.7.C** Describe what is meant by a “double helix.” (pg. 218)
- 4.7.D** Explain the different ways nucleotides are linked together (covalent vs. hydrogen bonds). (pg. 219)
- 4.7.E** Using knowledge of base pairing rules, explain how the numbers of Adenine and Guanine bases should compare to the number of Thymine and Cytosine bases. (pg. 218-219)
- 4.7.F** Identify the scientists credited with first describing the structure of DNA. (pg. 217-218)

___ **4.8 Explain the process of DNA replication. (pg. 216, 221-224)**

- 4.8.A** Explain why DNA is described as having a template mechanism for replication. (pg. 221-223)
- 4.8.B** Given one strand of DNA, identify the sequence of the complementary strand. (pg. 218, 222-223)
- 4.8.C** Explain the importance of the proofreading function in DNA replication. (pg. 224)